**EXPERIMENTAL PROBABILITY vs. THEORETICAL PROBABILITY**

**NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**



If I had a pair of dice that I was going to roll and you got a prize if I rolled your number, what number would you choose?

|  |
| --- |
| Your Lucky Number: |

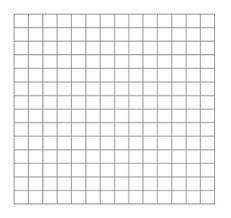
What were your reasons for choosing this number?

Ok…let’s try something with a pair of dice.

If you have ever considered yourself unlucky, you may want to change your luck with a little mathematics. Knowing what you are likely to roll when you release the dice is a matter of mathematical probability. To generate experimental probabilities, you roll the dice repeatedly, recording the value of the roll each time. By plotting the probability of rolling a particular combination, you will be able to see which combinations occur more often and which numbers appear luckier than others.  
  
ARE YOU FEELING LUCKY???

Let’s see how probably it is that your number will appear

**Probability Graph of 2 Dice being Rolled**

[](http://www.google.ca/imgres?imgurl=http://mathbits.com/mathbits/studentresources/graphpaper/14by14.jpg&imgrefurl=http://mathbits.com/mathbits/studentresources/graphpaper/graphpaper.htm&h=285&w=302&sz=19&tbnid=6w3NbGO_mJncRM:&tbnh=90&tbnw=95&prev=/search?q=small+graph+paper&tbm=isch&tbo=u&zoom=1&q=small+graph+paper&docid=60fsecGKke5WWM&hl=en&sa=X&ei=VMjqTo3SKMXc0QHWkaG-CQ&sqi=2&ved=0CDIQ9QEwAA&dur=2145)

Directions for bar graph:

1. Label x and y axis
2. Name x axis “sum of dice”

Label y axis as ‘number of outcomes”

1. Below each square along the x axis write the possible sum of the dice from least to greatest
2. Beside each square on the y axis number from #1-14
3. Roll dice and record the sum of each throw on the graph above. Keep throwing and recording until one of the numbers goes off the chart or until your teacher tells you to stop for discussion.

**DISCUSSION QUESTIONS:**

Experimental probability is calculated when the actual situation or problem is performed as an experiment. In this case, you would perform the experiment, and use the actual results to determine the probability.

1. **On your graph, which number appears the most frequently?**
2. **Which numbers appear the least frequently?**
3. Look at another group’s graph, how are they similar? Describe the shape of the graph?
4. Why do you think the graph has this shape?

Theoretical probability is the probability that is calculated using math formulas. This is the probability based on math theory.

Guess what kids…the big KIDD already knew how your graphs should turn out based on what she knows about MATH. Experimental probability won’t always match exactly but it is very likely to be close.

Can you figure out a way to use numbers to PROVE which numbers should come up the most frequently and which should come up the least frequently?

Totals ways Probability/%

SOMETHING TO THINK ABOUT:

* Many students (and adults) do not realize that if a fair die is rolled five times and the number 5 appears each time, the likelihood of the number 5 appearing on the next roll is still 1/6 (no more and no less).

Each and every time I roll the die, I have a 1 in 6 chance of rolling a 5.

No matter how many times you roll a die, the probability that a 5 will come up on a certain roll is ALWAYS 1/6, The rolls that came before do not change the rolls that will come in the future.